CLAIMS

I claim:

1. A fully-integrated amplifier for amplifying electrical signals in the mHz to kHz range while rejecting large DC offsets.

2. The amplifier of claim 1, wherein the large DC offsets range up to several volts.

3. The amplifier of claim 1, the amplifier operating at a low noise of less than 20 μVrms.

4. The amplifier of claim 1, the amplifier operating with a low power of less than 1 mW, allowing many amplifiers to be fabricated on a single, low-power chip.

5. The amplifier of claim 1, wherein the amplifier is a bioamplifier for bioelectrical signals.

6. The amplifier of claim 5, the bioelectrical signals being neural signals, biopotential signals, or other muscle signals.

7. The amplifier of claim 1, comprising one or more MOS pseudo-resistors in series.

8. The amplifier of claim 7, wherein two or more MOS pseudo-resistors configured in series reduce the nonlinear distortion in the amplifier.

9. A biosignal amplifier comprising at least one MOS transistor or other circuit element having a large incremental resistance for small voltages that operates as a pseudo-resistor to amplify electrical signals down to the Hz and sub-Hz range while rejecting large DC offsets.

10. The amplifier of claim 9, wherein the biosignal amplifier is used for bioelelectrical signals.

11. The amplifier of claim 10, the bioelectrical signals being biopotential signals or neural signals.

12. The amplifier of claim 9, wherein the large DC offsets range up to several volts.

13. The amplifier of claim 9, the amplifier operating at a low noise of less than 20 μVrms.

14. The amplifier of claim 9, the amplifier operating with a low power of less than 1 mW.

15. The amplifier of claim 9, wherein at least one MOS transistor functions as a diode-connected pMOS device with a negative voltage and a diode-connected bipolar transistor with a positive voltage.

16. The amplifier of claim 9, further comprising two or more single-transistor MOS pseudo-resistors in series.

17. The amplifier of claim 16, wherein two or more MOS pseudo-resistors in series reduce the nonlinear distortion in the amplifier.

18. The amplifier of claim 15, wherein the use of small MOS pseudo-resistors to high-pass filter the signal at low frequencies allows for the construction of small integrated amplifiers.

19. An amplifying system, comprising a fully-integrated amplifier for amplifying electrical signals down to the Hz or sub-Hz range while rejecting large DC offsets.

20. An amplifying system, comprising a biosignal amplifier comprising at least one MOS transistor that operates as a pseudo-resistor to amplify electrical signals down to the Hz or sub-Hz range while rejecting large DC offsets.

21. The amplifying system of claim 20, the amplifier further comprising a pair of input transistors and at least one other transistor.

22. The amplifying system of claim 21, wherein the pair of input transistors are configured to operate in the sub-threshold regime and at least one other transistor is configured to operate above the threshold level.

23. A method for amplifying a neural or other biopotential signal, comprising:

providing a source of neural or other biopotential signals;

providing a fully-integrated amplifier for amplifying electrical signals in the mHz to kHz range while rejecting large DC offsets; and

electrically connecting the amplifier with the signal source.

24. The method of claim 21, the source of neural or other biopotential signals comprising an electrode array.

25. The method of claim 21, including electrically connecting the amplifier to the electrode array.

26. A method for amplifying a neural or other biopotential signal, comprising:

providing a source of neural or other biopotential signals;

providing a bioamplifier comprising at least one MOS transistor that operates as a pseudo-resistor to amplify electrical signals down to the Hz or sub-Hz range while rejecting large DC offsets; and

electrically connecting the amplifier with the neural signal source.

27. The method of claim 26, the source of neural or other biopotential signals comprising

an electrode array.

28. The method of claim 27, including electrically connecting the bioamplifier to the electrode array.

29. The method of claim 26, the source of neural or other biopotential signals comprising a surface electrode array.

30. The method of claim 29, including electrically connecting the bioamplifier to surface electrodes.

31. A fully-integrated amplifier for amplifying electrical signals down to the Hz or sub-Hz range while rejecting large DC offsets, comprising one or more single-transistor MOS pseudo-resistors in series.

32. The amplifier of claim 31, wherein two or more single-transistor MOS pseudo-resistors reduce the nonlinear distortion in the amplifier.